

December 18, 2008

## Appendix A

The 325kW (ac) solar photovoltaic (PV) power system located at Pilgrim Furniture City, 1755 Boston Post Road, Milford CT is interconnected to the local electrical distribution grid using a 'behind the meter' 480V 3 phase interconnection. As such, electricity that is generated by the solar PV system is used by the Pilgrim Furniture facility, effectively reducing the demand on the local electricity distribution grid. During periods when the solar PV system produces more electricity than is needed by the Pilgrim Furniture facility, the excess electricity is delivered back to the distribution grid via the utility company's transformer. The solar PV system electrical layout and interconnection arrangement are detailed in the attached drawings.

There are two solar PV inverters that control the electrical interconnection between the solar PV system and the local distribution grid. These are a Satcon 225kW inverter (model AE-225-60-PV-A) and a Satcon 100kW inverter (model AE-100-60-PV-A). These inverters are designed, manufactured and certified in full accordance with UL 1741. Inverter cutsheets are attached.

The electricity production from the Solar PV system is measured by means of a revenue-grade metering system, this incorporating the following primary components:

- Two "Shark 100" revenue-grade meters (manufactured by Electro Industries), with each meter measuring the electricity output from one of the inverters.
- A Draker Laboratories "Sentalis 1000" monitoring system, enabling the output of these meters to be accessible remotely via internet connectivity.

Electrical generation data is manually entered into the NEPOOL GIS system via the GIS website. Performance has not been verified by ISO-New England. However, the design and certification of the Shark 100 meters is in full accordance with ANSI C12.20 (0.2% accuracy) and IEC 687 (0.2% accuracy). The Shark 100 meter cutsheet is attached.

Sincerely,  
Soltage, LLC  
Soltage – PLG 500 Milford, LLC  
Soltage – MGTCO 1, LLC

Stephen A Goodbody  
*Vice President, Engineering*

Attached:      Electrical single and three line diagrams (2 drawings)  
                    Satcon 100kW and 225 kW inverter cutsheets (2 cutsheets)  
                    Electro Industries Shark 100 meter cutsheet (1 cutsheet)

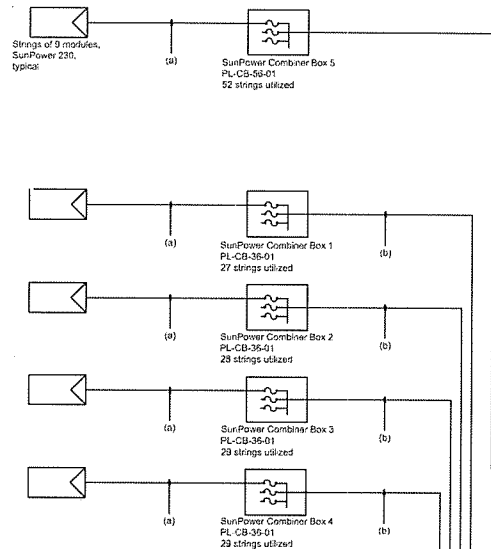


Table 1: Combiner Box / Output Conductors

System A:					
Box	# Circuits	Distance	AWG	Conduit	Vdrop
C5	52	45	2x3x4/0	3" EMT	0.1%
System B:					
Box	# Circuits	Distance	AWG	Conduit	Vdrop
C1	27	243	2x2x3/0	2 1/2" EMT	0.4%
C2	28	297	2x2x3/0	2 1/2" EMT	0.6%
C3	29	196	2x2x3/0	2 1/2" EMT	0.4%
C4	29	111	2x2x3/0	2 1/2" EMT	0.2%

Note: SunPower 230 module requires POSITIVE source circuits to be grounded. Positive source end output circuits conductors are not switched. Switch negative conductors only.

#### Wire Schedule

(a) ARRAY WIRING	2x#10 USE-2; #10 GROUND; TYPICAL	
(b) STRING COMBINER 1-4 JUT	2 SETS 2X3/0 THWN-2; #3 GROUND	In 2' EMT
(c) STRING COMBINER 5 OLT	3 SETS 2x4/0 THWN-2; #1 GROUND	In 2 1/2" EMT
(d) SUB-ARRAY COMBINER 325KW OUT	4 SETS 2x350KCM THWN-2; 3/0 GND	In 4 x 2 1/2" EMT
NOTE: RUN (d) WIRE PAIRS IN 4 SEPARATE CONDUITS		
(e) INVERTER 100KW OUT	3x2/0 THWN-2; #6 GROUND	In 2' EMT
(f) INVERTER 225KW OUT	3x500KCM THWN-2; #3 GROUND	In 3' EMT
(g) PVDP OUT	2 SETS 3x250KCM THWN-2; #1 GROUND	In 2 x 2 1/2" EMT
(h) UTILITY DISCONNECT OUT	2 SETS 3x250KCM THWN-2; #1 GROUND	In 2 x 2 1/2" EMT
NOTE: RUN (g) AND (h) WIRE SETS IN 2 SEPARATE CONDUITS		
(i) GEC/LIGHTNING PROTECTION	1x350	
(j) GEC	1x#6	

#### Inverter settings

27-1	under voltage (>0.16s)	0.5	puV
27-2	under voltage (>2s)	0.88	puV
59-1	over voltage (>1s)	1.1	puV
59-2	over voltage (>0.16s)	1.2	puV
81o	over frequency (>0.16s)	60.5	Hz
81u-1	under frequency (300s)>0.16s	59.8-57	Hz
81u-2	under frequency (>0.16s)	57	Hz

#### Inverter - Satcon AE-225-60-PV-A

Maximum Output Power	225	kW
AC Output Voltage	277/480	VAC
Nominal Output Current	270	A
DC Maximum Input Voltage	600	VDC
DC Maximum Current	718	A

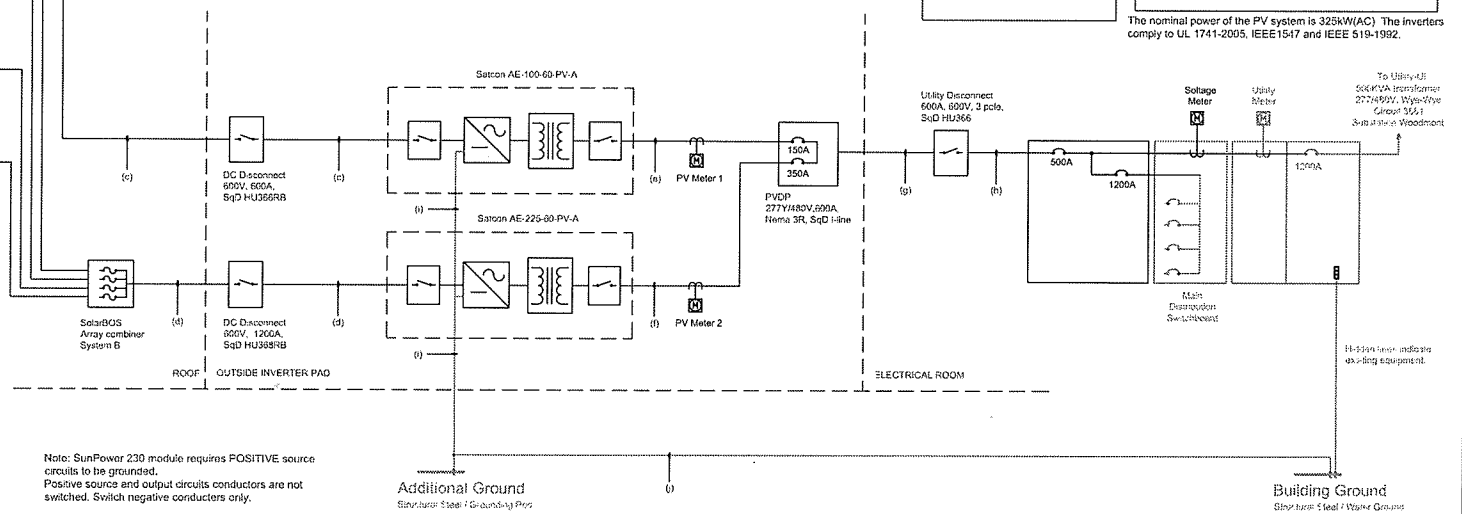
#### Module - SunPower 230

Pstc	230 W
Vmp	40 V
Imp	5.61 A
Voc	48.7 V
Isc	5.99 A

#### Inverter - Satcon AE-100-60-PV-A

Maximum Output Power	100	kW
AC Output Voltage	277/480	VAC
Nominal Output Current	121	A
DC Maximum Input Voltage	600	VDC
DC Maximum Current	319	A

The nominal power of the PV system is 325kW(AC). The inverters comply to UL 1741-2005, IEEE1547 and IEEE 519-1992.



#### PV - BASIC ELECTRICAL SCHEMATIC

Solar Energy Systems Inc.  
1205 Manhattan Avenue  
Suite 1210  
Brooklyn, NY 11222  
Phone:(718)389-1545  
Fax:(718)389-2820  
WWW.SOLARESYSTEMS.COM

NO.	DATE
RS	2008-MAR-27
RS	2008-MAR-31
RS	2008-APR-18
RS	2008-APR-28
RS	2008-MAY-05

Pilgrim Furniture  
1755 Boston Post Rd  
Milford, CT 06460

DESIGNED BY  
R.S.

DRAWN BY  
R.S.

CHECKED BY

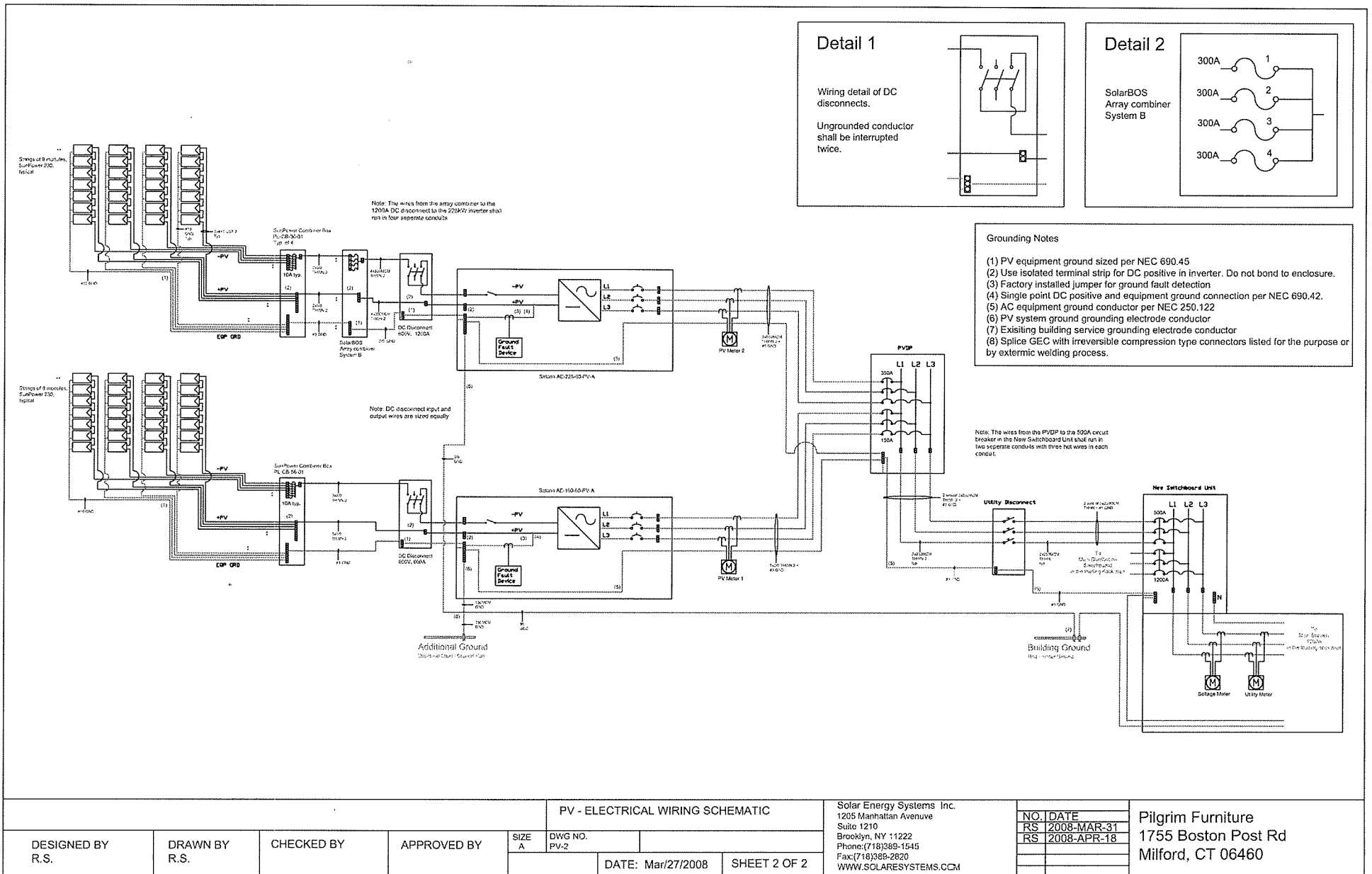
APPROVED BY

SIZE  
A

DWG NO.  
PV-1

DATE: Mar/21/2008

SHEET 1 OF 2



PV - ELECTRICAL WIRING SCHEMATIC							Solar Energy Systems Inc. 1205 Manhattan Avenue Suite 1210 Brooklyn, NY 11222 Phone: (718) 389-1545 Fax: (718) 389-2820 WWW.SOLARESYSTEMS.COM		Pilgrim Furniture 1755 Boston Post Rd Milford, CT 06460	
DESIGNED BY R.S.	DRAWN BY R.S.	CHECKED BY	APPROVED BY	SIZE A	DWG NO. PV-2	DATE: Mar/27/2008	SHEET 2 OF 2	NO. DATE RS 2008-MAR-31 RS 2008-APR-18		

PowerGate™ inverters offer market-leading reliability, efficiency and ease-of-use for large-scale grid-connected photovoltaic systems. A single-enclosure solution, the utility-grade PowerGate™ incorporates a high-efficiency transformer and both AC and DC switchgear that disconnect the inverter at night, minimizing tare losses. A highly efficient MPPT tracking algorithm and intelligent wake-up routine further maximize net energy harvest. The PowerGate™ is certified to UL-1741 and is available with a variety of local and remote data monitoring options.



### Utility-Grade Design

20-year design life • Reverse convection top-air entry  
• Sloped roof • 25-year film-type capacitors • 5-year standard warranty • Extended warranties available

### Easy Installation and Use

Single enclosure minimizes field wiring • Integrated high-efficiency transformer • Optional integrated sub-array combiner • Internal AC and DC switchgear • Top and bottom cable entry • Top-lifting eye-bolts and forklift base

### Superior Energy Harvesting

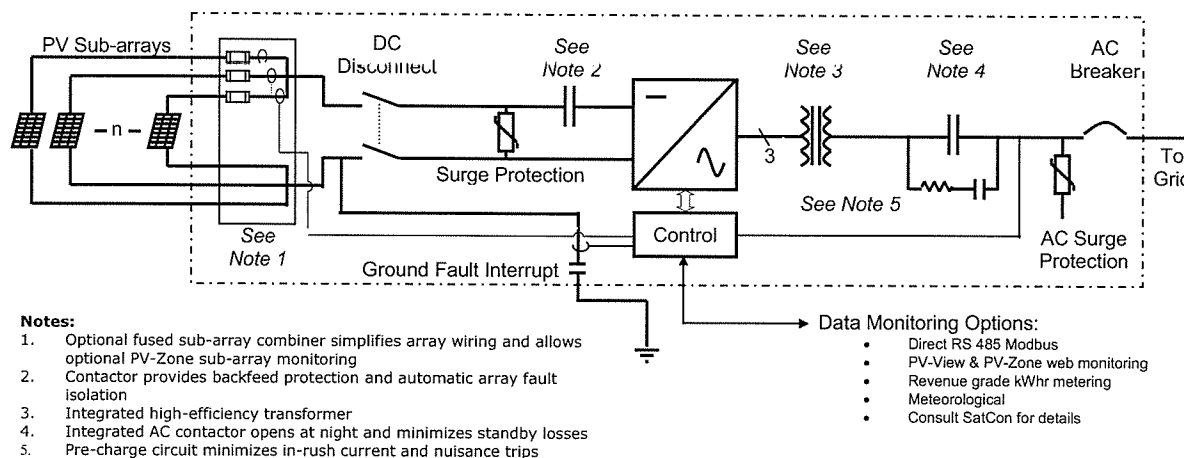
Industry leading efficiency • Automatic night disconnect minimizes transformer losses • High-speed MPPT • Soft charge network minimizes in-rush current and nuisance trips • Wide input voltage range

### Remote and Local Data Monitoring

4-line alphanumeric LCD display • Optional *PV View* web enabled data monitoring • Optional *PV Zone* sub-array performance monitoring • RS485 Modbus

### Safety

Certified to UL 1741 • Integrated DC contactor for array isolation • Surge withstand testing to ANSI 62.41 and IEEE1547-2003



## Specifications – Model Specific

Power (kWac)	225	
Model #	AE-225-60-PV	
Voltage Suffix	A	D
AC Output Voltage (L-L Vac)	480	208
Nom Current/Phase (Amps)	270	625
Max Fault Current/Phase (Amps)	330	960
CEC Efficiency (%)	94.5	NA
Nominal DC Current (Amps)	718	
Optional PV Sub- Array Combiner (# of fused strings)	12 x 100 Amps	
Max. Weight (lbs) [kg]	5650 [2570]	
Max Heat Dissipation (kBTU/hour)	44.3	

## Specifications – All Models

Nominal MPP DC range (Vdc)	330-600
Max MPPT Range (Vdc)	295-600 (Note)
Max Voc (Vdc)	600
Nom. Frequency Range (Hz)	59.5 - 60.5
AC Voltage Range Setpoints (%)	+/- 10
Power Factor	1
Harmonic Distortion (% THD)	<3
Peak Efficiency (%)	95-97
Cooling	Fan Forced
Noise level (dBA)	<65
Ambient Temp. range (degC)	-20 to 50
Max amb. temp. at Pnom (degC)	50
Enclosure rating	NEMA 3R
Enclosure Construction	11 gauge Powder Coated Steel - Seismic Zone 4

Relative humidity(%)	95
Altitude (ft) [m]	6000 [1830]
Display	LCD 4 Line x 20
Computer interface / type	RS232, RS485
Communication Protocol	Modbus
Standard Warranty	5 Year
Certification	UL 1741
Compliances	IEEE 929, 1547, 519, ANSI 62.41

## Optional Features

PV View® Remote Monitoring
PV Zone® Sub-Array Monitoring
Environmental monitoring
External revenue grade meter

Note: To achieve 295 volts "Low tap" must be specified at time of order. Unit will derate if grid voltage is < nominal.

## Enclosure Layout and Dimensions

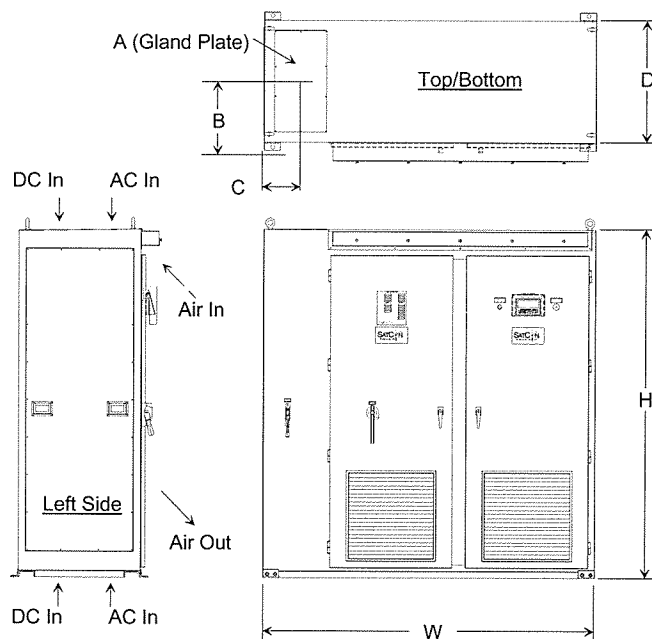
HxWxD (in) [mm]	85.63x82x30 [2175x2083x762]
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### Top Gland Plate

A (in) [mm]	24x12 [610x305]
B (in) [mm]	15 [381]
C (in) [mm]	9 [229]

### Bottom Gland Plate

A (in) [mm]	20x11 [508x280]
D (in) [mm]	15 [381]
C (in) [mm]	8.5 [216]



All specifications and drawings subject to change without notice.

PowerGate<sup>™</sup> inverters offer market-leading reliability, efficiency and ease-of-use for large-scale grid-connected photovoltaic systems. A single-enclosure solution, the utility-grade PowerGate<sup>™</sup> incorporates a high-efficiency transformer and both AC and DC switchgear that disconnect the inverter at night, minimizing tare losses. A highly efficient MPPT tracking algorithm and intelligent wake-up routine further maximize net energy harvest. The PowerGate<sup>™</sup> is certified to UL-1741 and is available with a variety of local and remote data monitoring options.



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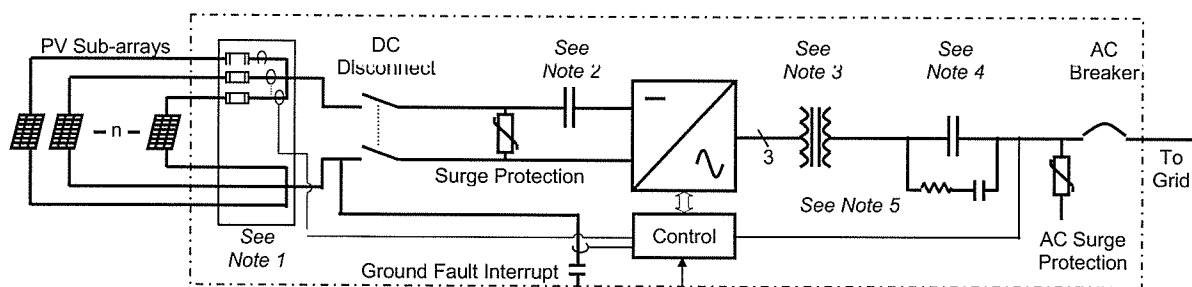
Industry leading efficiency • Automatic night disconnect minimizes transformer losses • High-speed MPPT • Soft charge network minimizes in-rush current and nuisance trips • Wide input voltage range

### Remote and Local Data Monitoring

4-line alphanumeric LCD display • Optional *PV View* web enabled data monitoring • Optional *PV Zone* sub-array performance monitoring • RS485 Modbus

### Safety

Certified to UL 1741 • Integrated DC contactor for array isolation • Surge withstand testing to ANSI 62.41 and IEEE1547-2003



#### Notes:

1. Optional fused sub-array combiner simplifies array wiring and allows optional PV-Zone sub-array monitoring
2. Contactor provides backfeed protection and automatic array fault isolation
3. Integrated high-efficiency transformer
4. Integrated AC contactor opens at night and minimizes standby losses
5. Pre-charge circuit minimizes in-rush current and nuisance trips

#### Data Monitoring Options:

- Direct RS 485 Modbus
- PV-View & PV-Zone web monitoring
- Revenue grade kWhr metering
- Meteorological
- Consult SatCon for details

## Specifications – Model Specific

Power (kWac)	75			100		
Model #	AE-75-60-PV			AE-100-60-PV		
Voltage Suffix	D	F	A	D	F	A
AC Output Voltage (L-L Vac)	208	240	480	208	240	480
Nom Current/Phase (Amps)	208	181	91	278	241	121
Max Fault Current/Phase (Amps)	260	230	115	350	290	150
CEC Efficiency (%)	95	NA	95.5	94.5	95	94.5
Nominal DC Current (Amps)	240			319		
Optional PV Sub- Array Combiner (# of fused strings)	6 x 100 Amps			6 x 100 Amps		
Max. Weight (lbs) [kg]	2600 [1180]			3250 [1475]		
Max Heat Dissipation (kBTU/hour)	10.5			13.6		

## Specifications – All Models

Nominal MPP DC range (Vdc)	330-600
Max MPPT Range (Vdc)	295-600 (Note)
Max Voc (Vdc)	600
Nom. Frequency Range (Hz)	59.5 - 60.5
AC Voltage Range Setpoints (%)	+/- 10
Power Factor	1
Harmonic Distortion (% THD)	<3
Peak Efficiency (%)	95-97
Cooling	Fan Forced
Noise level (dBA)	<65
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Computer interface / type	RS232, RS485
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Compliances	IEEE 929, 1547, 519, ANSI 62.41

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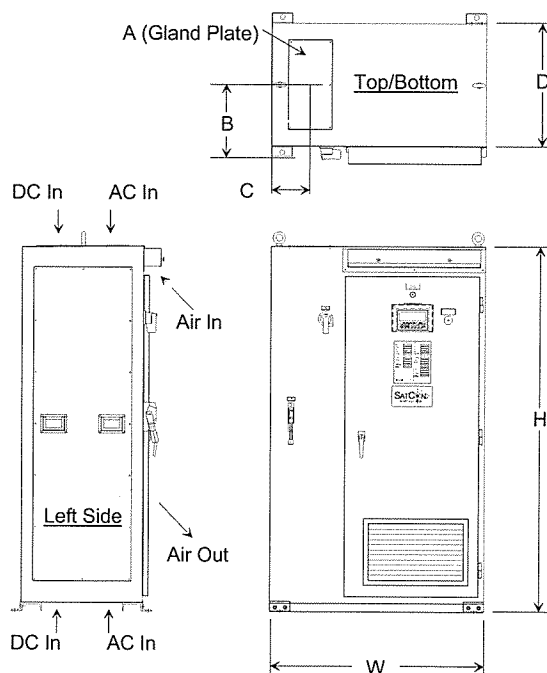
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### Top Gland Plate

A (in) [mm]	20x8 [508x203]
B (in) [mm]	15 [381]
C (in) [mm]	8 [203]

### Bottom Gland Plate

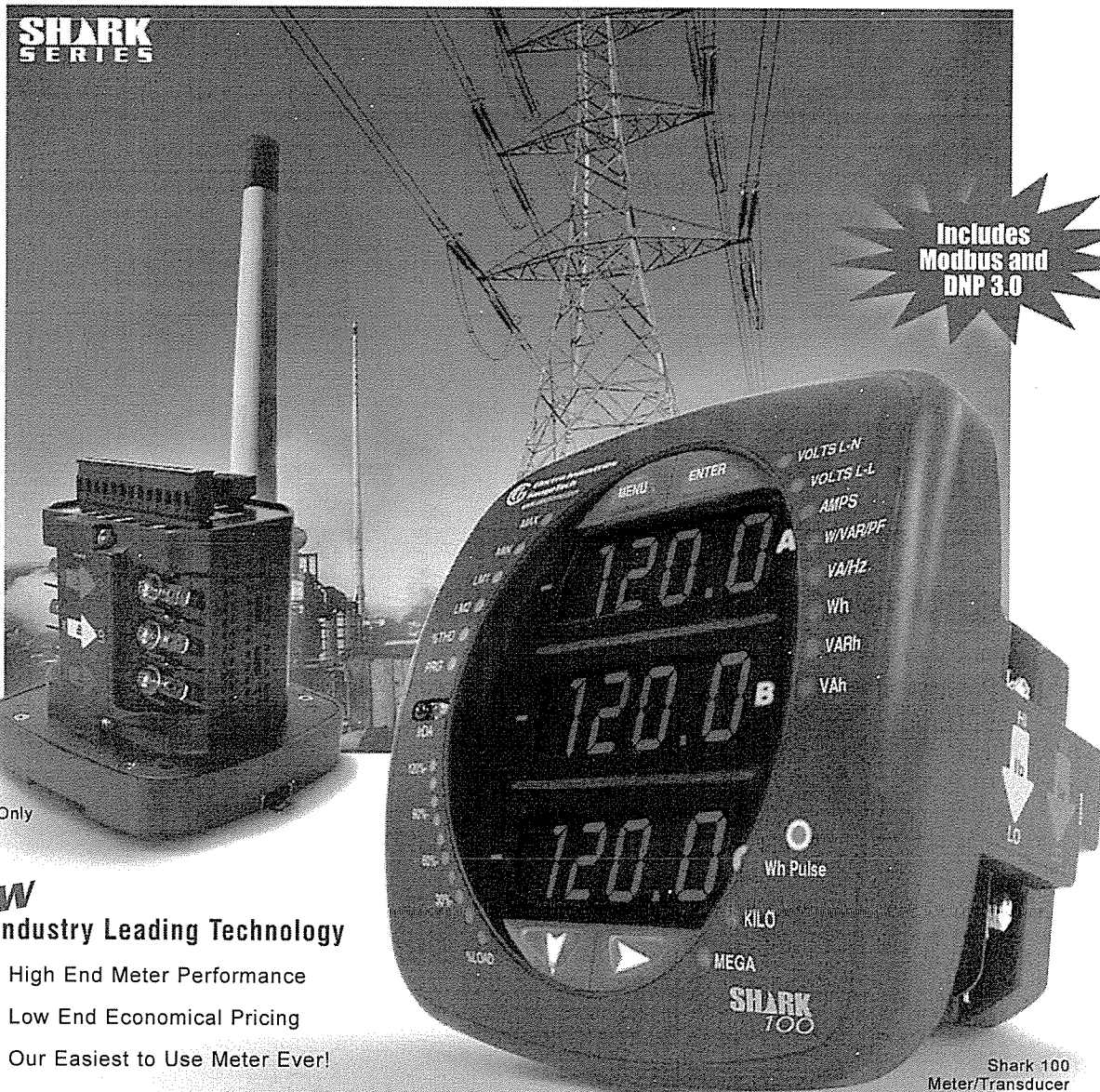
A (in) [mm]	20x6 [508x152]
B (in) [mm]	15 [381]
C (in) [mm]	4 [102]



# SHARK100

## MULTIFUNCTION POWER AND ENERGY METER

Revenue Grade



Shark 100T  
Transducer Only

### **NEW** Industry Leading Technology

- High End Meter Performance
- Low End Economical Pricing
- Our Easiest to Use Meter Ever!

Shark 100  
Meter/Transducer

A G G R E S S I V E   T E C H N O L O G Y

 **Electro Industries/GaugeTech**  
The Leader In Web Accessed Power Monitoring  
[www.electroind.com](http://www.electroind.com)





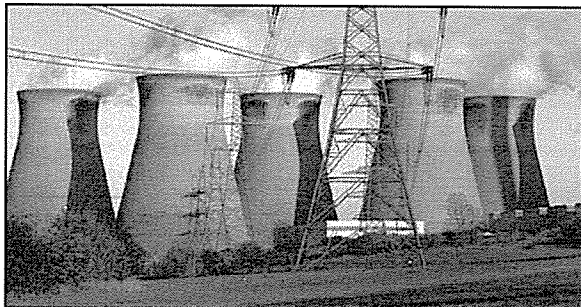
## Feature Summary

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- 0.2% Class Revenue Certifiable Energy and Demand Metering
- Meets ANSI C12.20 (0.2%) and IEC 687 (0.2%) Accuracy Classes
- Multifunction Measurements including Voltage, Current, Power, Frequency, Energy, etc.
- Optional KYZ Pulse
- Power Quality Measurements (%THD and Alarm Limits)
- V-Switch® Technology - Field Upgrade without Removing Installed Meter
- 3 Line .56" Bright Red LED Display
- % of Load Bar for Analog Meter Perception
- RS485 Modbus and DNP 3.0 Protocol - 57.6K Baud
- IrDA Port for PDA Remote Read
- Ultra Compact, Easy to Install
- Fits Both ANSI and DIN Cut-Outs
- Available in a Transducer Only Version



AGGRESSIVE TECHNOLOGY



## Applications

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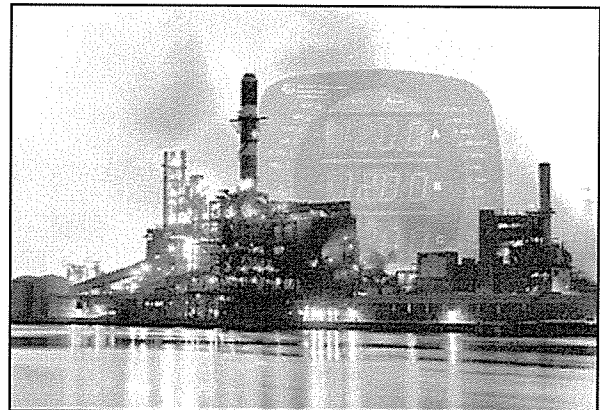
- |                    |                            |
|--------------------|----------------------------|
| • Utility Metering | • Commercial Metering      |
| • Substations      | • Industrial Metering      |
| • Power Generation | • Campus Metering          |
| • Submetering      | • Analog Meter Replacement |

## Introduction

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Electro Industries introduces one of the industry's highest performance revenue grade panel meters. Based on an all new platform, this low cost meter significantly outperforms other devices many times its price. This unit is perfect for new metering applications and for a simple replacement to existing analog meters.

The Shark excels in metering energy accurately exceeding ANSI C12.20 (0.2%) and IEC 687 (0.2%) energy measurement standards. The unit utilizes high speed DSP technology with high resolution A/D conversion to provide revenue certifiable accuracy for Utility Billing, Substation Metering, Submetering and Critical Metering applications.



## V-Switch, Measurement Upgrade Packs

The Shark 100 is equipped with EIG's exclusive V-Switch® Technology. V-Switch® is a virtual firmware-based switch that allows you to enable meter features through communication, even after installation. Using V-Switches, you can purchase what you require now and field upgrade functionality as needed. This allows you to optimize your metering investment. Begin with a simple indication meter and upgrade it to full functioning energy billing meter with advanced measurement capability. Advanced versions of the Shark 100 (V3 and V4) also include DNP 3.0 communication protocol.

### Available V-Switches:

- **V-Switch 1** – Volts and Amps Meter – Default
- **V-Switch 2** – Volts, Amps, kW, kVAR, PF, kVA, Freq.
- **V-Switch 3** – Volts, Amps, kW, kVAR, PF, kVA, Freq. kWh, kVAh, kVARh and DNP 3.0
- **V-Switch 4** – Volts, Amps, kW, kVAR, PF, kVA, Freq. kWh, kVAh, kVARh, %THD Monitoring, Limit Exceeded Alarms and DNP 3.0

## Accuracy

Measured Parameters	Accuracy % of Reading	Display Range
Voltage L-N	0.1%	0-9999 Scalable V or kV
Voltage L-L	0.1%	0-9999 V or kV Scalable
Current	0.1%	0-9999 Amps or kAmps
+/- Watts	0.2%	0-9999 Watts, kWatts, MWatts
+/-W/h	0.2%	5 to 8 Digits Programmable
+/-VARs	0.2%	0-9999 VARs, kVARs, MVARs
+/-VARh	0.2%	5 to 8 Digits Programmable
VA	0.2%	0-9999 VA, kVA, MVA
VAh	0.2%	5 to 8 Digits Programmable
PF	0.2%	+/- 0.5 to 1.0
Frequency	0.01 Hz	45 to 65 Hz
%THD	5.0%	0 to 100%
% Load Bar	1-120%	10 Digit Resolution Scalable

*Note: Typical results are more accurate. Applies to 3 Element WYE and 2 Element Delta Connections.*

## Traceable Watt-Hour Test Pulse for Accuracy Verification

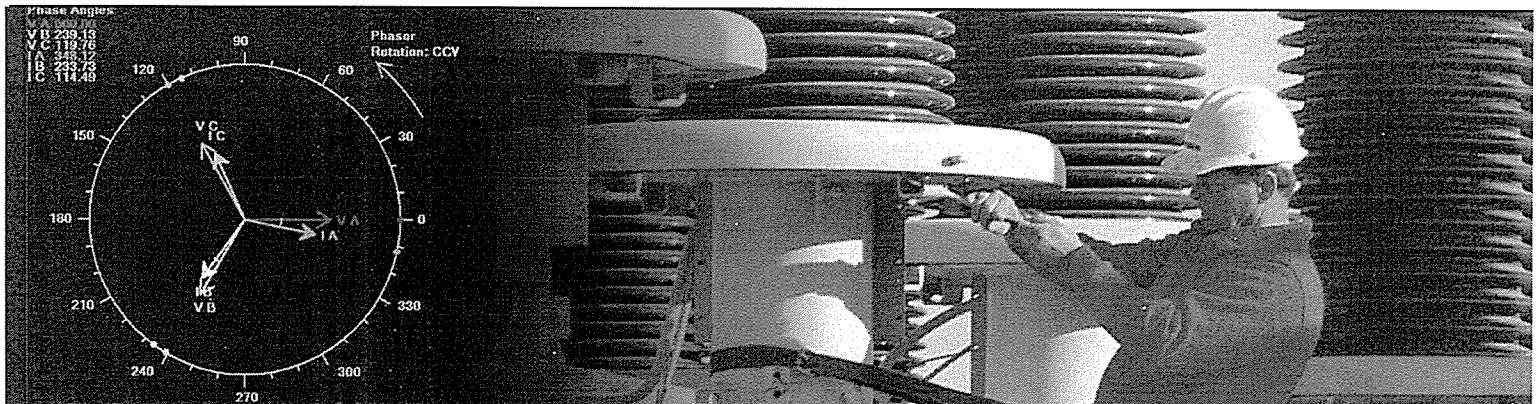
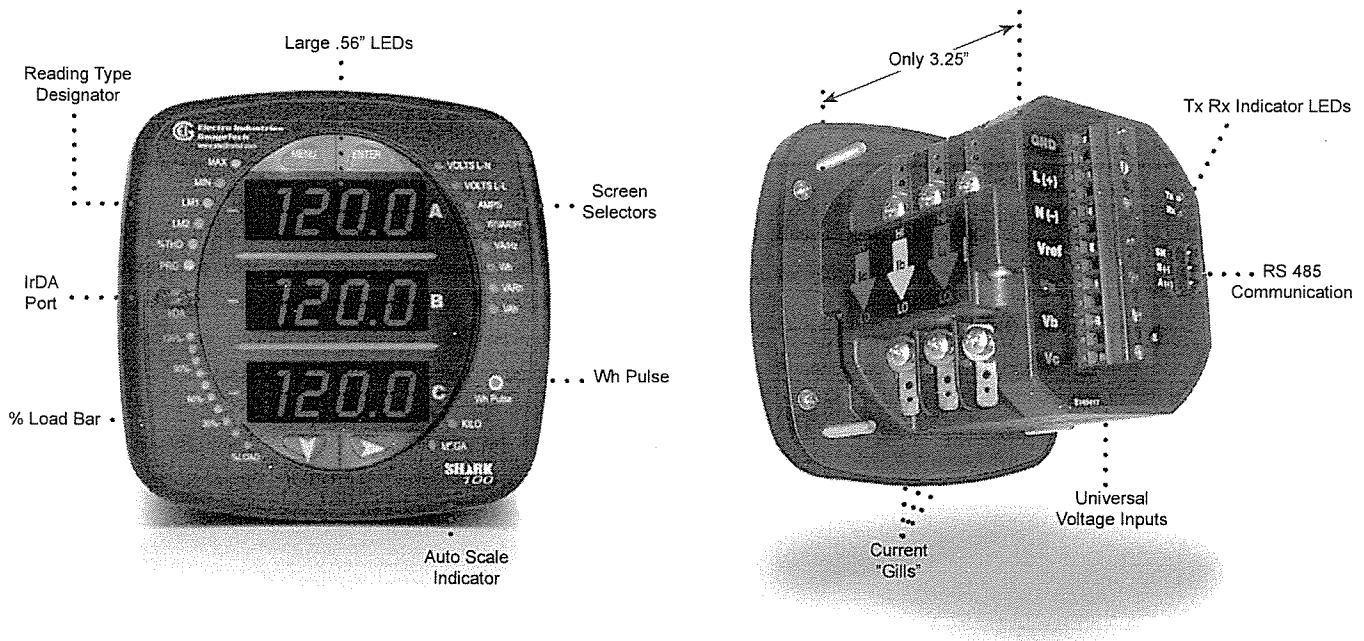
To be certified for revenue metering, power providers and utility companies need to know that the billing energy meter will perform to the stated accuracy. To verify the meter's performance and calibration, power providers use field test standards to ensure that the unit's energy measurements are correct. Since Shark 100 is a traceable revenue meter, it contains a utility grade test pulse allowing power providers to verify and confirm that the meter is performing to its rated accuracy. This is an essential feature required of all billing grade meters.

Measured Values	Real-Time	Avg	Max	Min
Voltage L-N	•		•	•
Voltage L-L	•		•	•
Current Per Phase	•	•	•	•
Watts	•	•	•	•
VAr	•	•	•	•
VA	•	•	•	•
PF	•	•	•	•
+Watt-hr	•			
-Watt-hr	•			
Watt-hr net	•			
+VAR-hr	•			
-VAR-hr	•			
VAR-hr net	•			
VA-hr	•			
Frequency	•		•	•
%THD	•		•	•
Voltage Angles	•			
Current Angles	•			
% of Load Bar	•			

## Easy To Use and Install

EIG Engineers designed this meter to be as easy to use and install as possible. From user interface to mechanical construction, many hours were spent to make the Shark straightforward and intuitive so an installer with minimal meter experience and training can succeed with the product. Shark is programmed using a PDA, a PC Computer or through a simple keypad interface. Additionally, using the PC or PDA, a technician or electrician can see a visual phasor diagram of the vectors insuring that CT and Voltage polarities are correct. All inputs are color coordinated and have clear simple-to-understand labeling to avoid cross wiring mistakes by installers. This is very useful in OEM applications in which time of install affects the cost of the product.

- Easy to Use Faceplate Programming
- PC Setup
- PDA Setup using IrDA Port
- Phasor Diagram Showing Wiring Status
- Auto Scroll Feature
- Analog Style % of Load Bar
- Shallow Panel Depth
- Quick Connect Voltage and Com Leads
- Quick Connect Current Pass Through
- Color Coordinated Voltage and Current Inputs



Standard Feature Includes Real Time Phasor Analysis

## Superior Voltage and Current Inputs

The Shark 100 is ruggedly designed for harsh electrical applications on both high voltage as well as low voltage power systems. This is especially important in Power Generation, Utility Substation and Critical User applications. The structural and electrical design of this meter was developed based on the recommendations and approvals of many of our Utility customers.

### Universal Voltage Inputs

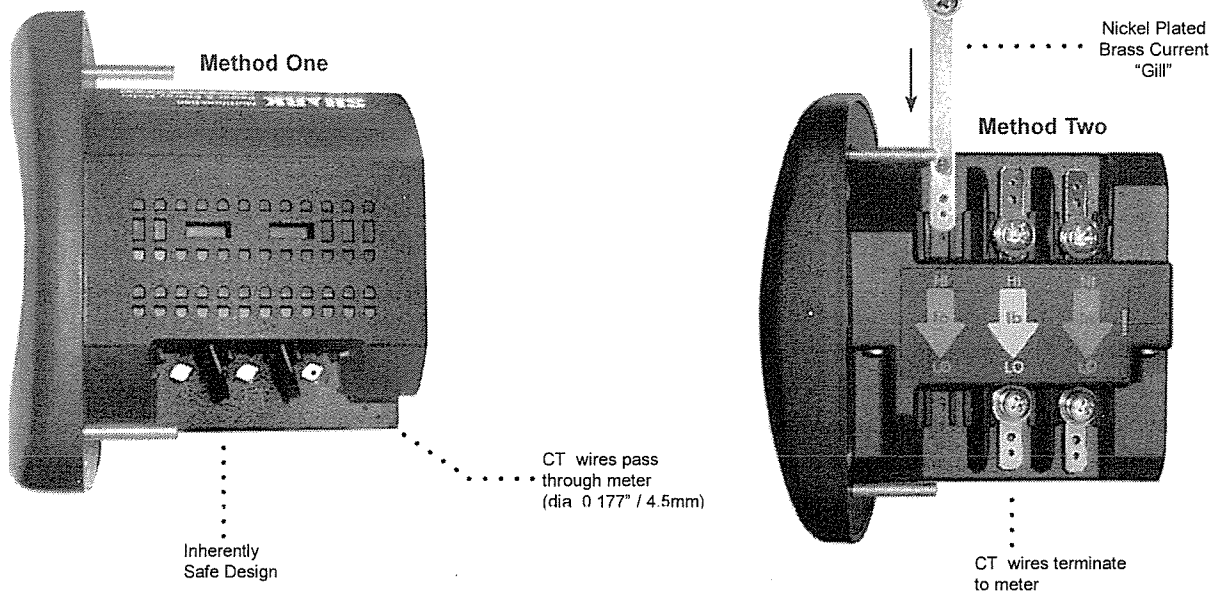
Voltage inputs allow measurement to 416 Volts Line to Neutral and 721 Volts Line to Line. This insures proper meter safety when wiring directly to high voltage systems. One unit will perform to specification on 69 Volt, 120 Volt, 230 Volt, 277 Volt and 347 Volt power systems.

### Current Inputs

Current inputs uniquely use a dual input method:

- **Method One** – CT Pass Through. The CT passes directly through the meter without any physical termination on the meter. This insures that the meter cannot be a point of failure on the CT circuit. This is preferable to utility users when sharing relay class CTs. No Burden is added to the secondary CT circuit.

- **Method Two** – Current "Gills." This unit additionally provides ultrarugged termination pass-through bars, allowing the CT leads to be terminated on the meter. This, too, eliminates any possible point of failure at the meter. This method is also a preferred technique for insuring that relay class CT integrity is not compromised. Inferior designs do not provide this advanced protective aspect and utilize terminal blocks to pass CT current through a soldered connection on a printed circuit board. Shark's stud-based design insures that your CTs will not open in a fault condition.



## Utility Peak Demand Metering

The Shark 100 provides user-configured Block Window or Rolling Window Demand. This allows you to set up a particular utility demand profile. Block Window Demand is demand used over a fixed user-configured demand period (usually 5, 15 or 30 minutes). Rolling Window Demand is a fixed window demand that moves for a user specified sub-interval period. An example would be a 15-minute demand

using 3 subintervals, providing a new demand reading every 5 minutes based on the last 15 minutes. Readings for kW, kVAR, kVA and PF are calculated using utility demand structures. All other parameters offer max and min capability over the user-selectable averaging period. Voltage provides an instantaneous max and min reading, displaying the highest surge and lowest sag seen by the meter.

## Advanced Communication Capability with IrDA Interface

The Shark 100 provides two independent Communication ports with advanced features.

### Back Mounted Port with KYZ Pulse (option 485P)

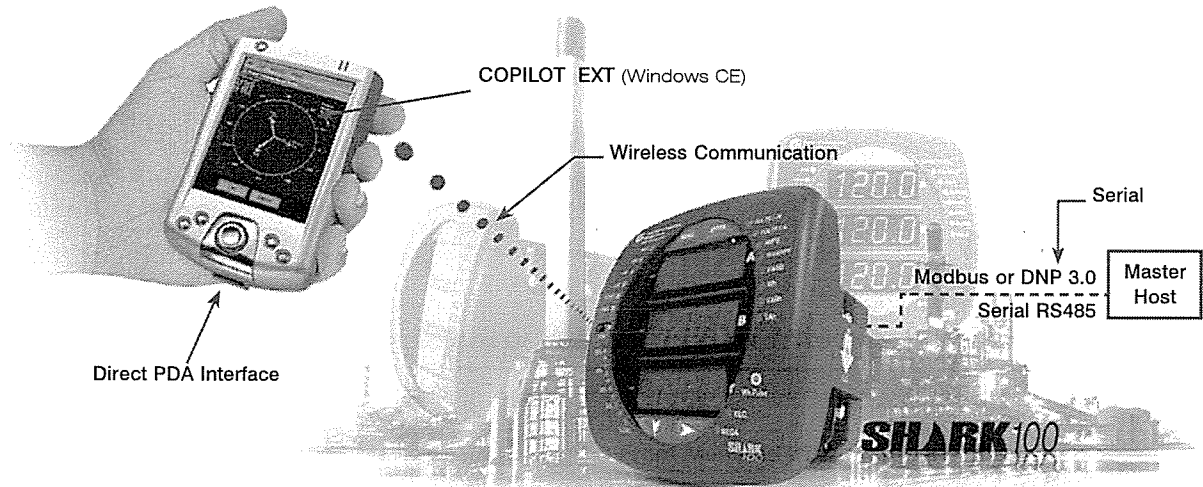
- RS485 - This port allows RS485 communication using Modbus or DNP3.0 Protocols. Baud rate are from 9600 to 57.6k.
- KYZ Pulse - In addition to the RS485, the meter also includes a KYZ pulse mapped to positive energy. This is a fixed energy pulse. Pulse values are:

$K(h)$  at Test Volts less than 150V=0.0501151926

$K(h)$  at Test Volts more than 150V=0.2004607704

### Front Mounted IrDA Communication

Uniquely, the Shark also has an optical IrDA port, allowing the unit to be set up and programmed using a PDA or remote laptop without need for a communication cable. Just point at the meter with an IrDA-equipped PC or PDA and configure it. COPILOT EXT is a Windows CE software package that allows you to simply point at a Shark, configure it and poll readings.

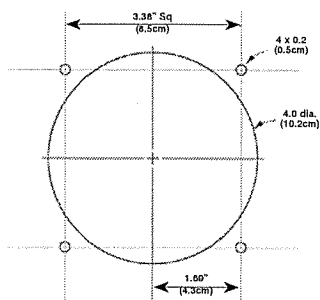


Simultaneous Dual Communication Paths

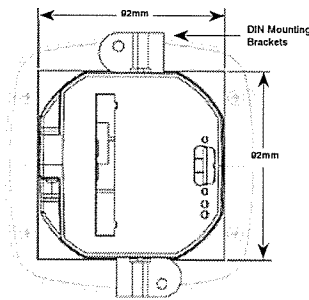
## Shark 100 ANSI and DIN Mounting

The unit mounts directly in an ANSI C39.1 (4" Round form) or an IEC 92 mm DIN square form. This is perfect for new installations and for existing panels. In new installations, simply use existing DIN or ANSI punches. For existing panels, pull out old analog meters and replace them with the Shark 100. The meter uses standard voltage and current inputs so that CT and PT wiring do not need to be replaced.

### ANSI Mounting

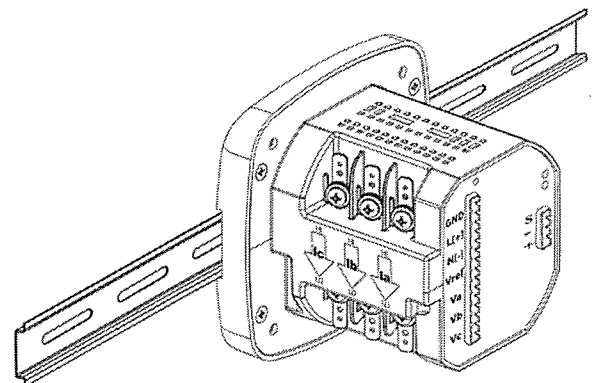


### DIN Mounting



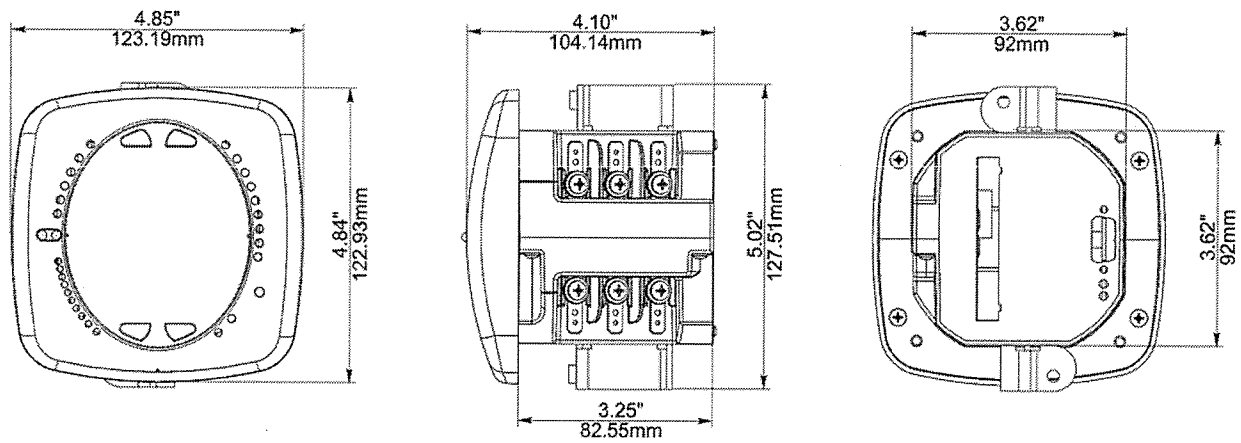
## Shark 100T ANSI and DIN Mounting

The Shark 100T is a transducer version of the Shark100 which does not include a display. The unit mounts directly to a DIN rail and provides an RS485 Modbus or DNP 3.0 output.

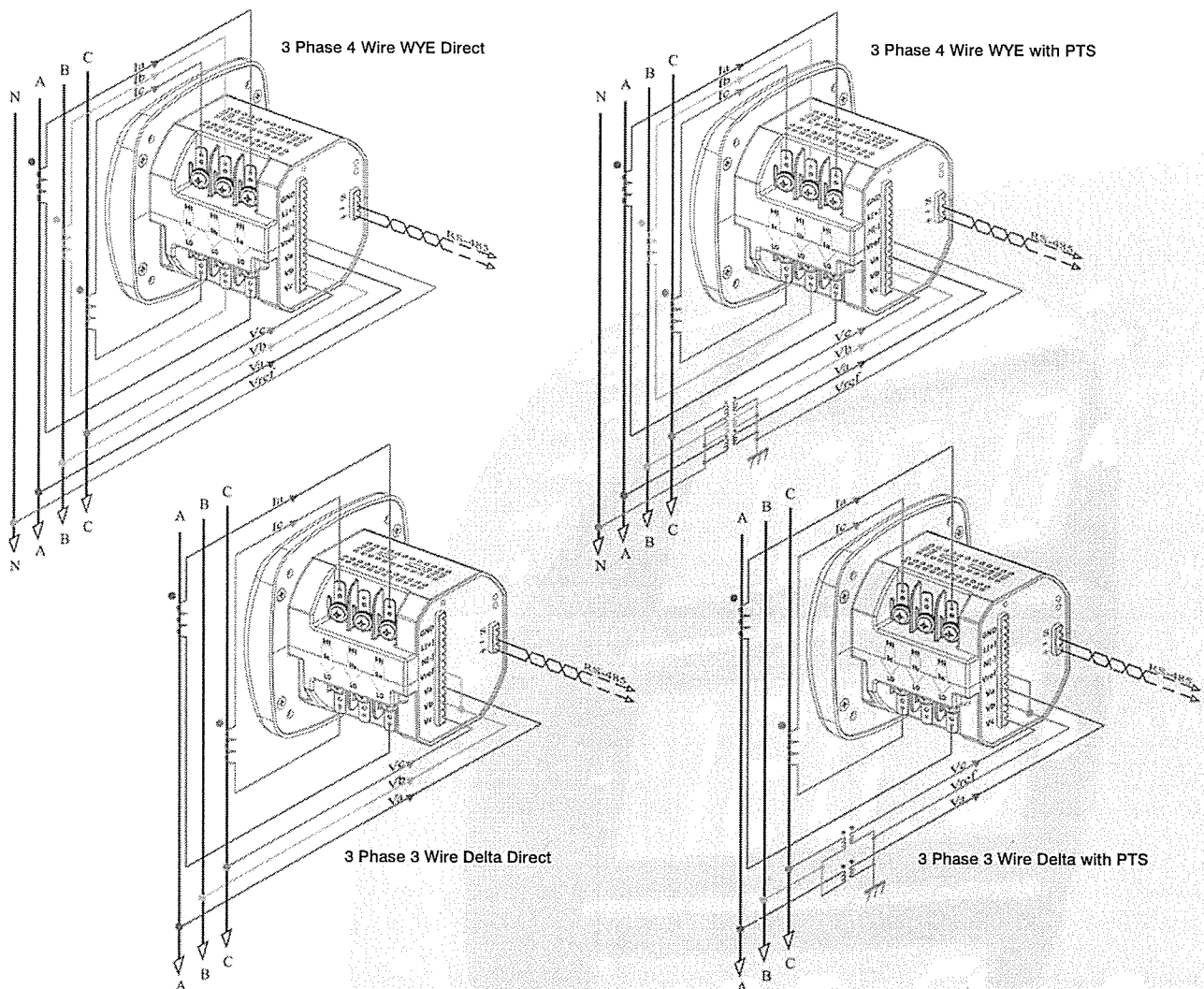


Shark 100T - DIN Rail Mounted Transducer

## Dimensional Drawings



## Wiring Diagrams





## Specifications

### Voltage Inputs

- 0-416 Volts Line To Neutral, 0-721 Volts Line to Line
- Universal Voltage Input
- Input Withstand Capability – Meets IEEE C37.90.1 (Surge Withstand Capability)
- Programmable Voltage Range to Any PT ratio
- Supports: 3 Element WYE, 2.5 Element WYE, 2 Element Delta, 4 Wire Delta Systems
- Burden: 0.36VA per phase Max at 600V, 0.014VA at 120 Volts
- Input wire gauge max (AWG 12 / 2.5mm<sup>2</sup>)
- Note: Accuracy specs doubled for 2.5 Element connections.

### Current Inputs

- Class 10: (0 to 11) A, 5 Amp Nominal
- Class 2: (0 to 2) A, 1A Nominal Secondary
- Fault Current Withstand: 100 Amps for 10 Seconds, 300 Amps for 3 Seconds, 500 Amps for 1 Second.
- Programmable Current to Any CT Ratio

- Burden 0.005VA per phase Max at 11Amps
- 5mA Pickup Current
- Pass through wire gauge dimension: 0.177" / 4.5mm

### Isolation

All Inputs and Outputs are galvanically isolated to 2500 Volts AC.

### Environmental Rating

Storage: (-40 to +85)\* C

Operating: (-30 to +70)\* C

Humidity: to 95% RH Non-Condensing

### Faceplate Rating:

NEMA12 (Water Resistant)  
Mounting Gasket Included

### Sensing Method

- True RMS
- Sampling at 400+ Samples per Cycle on all channels measured readings simultaneously
- Harmonic %THD (% of Total Harmonic Distortion)

### Update Rate

- Watts, VAR and VA-100msec
- All other parameters-1second

### Power Supply

#### Option D2:

- (90 to 265) Volts AC and (100 to 370) Volts DC. Universal AC/DC Supply

#### Option: D:

- 24-48VDC +/- 10%

Burden: 10VA max.

### Communication Format

- 2 Com Ports (Back and Face Plate)
- RS485 Port (Through Back Plate)
- IrDA (Through Faceplate)
- Com Port Baud Rate: (9600 to 57,600)
- Com Port Address: 0-247
- 8 Bit, No parity
- Modbus RTU, ASCII or DNP 3.0 Protocols

### KYZ Pulse

- Type Form A
- On Resistance: 23-35W
- Peak Voltage: 350 VDC
- Continuous Load Current: 120 mA
- Peak Load Current: 350mA (10ms)
- Off Stat Leakage Current @ 350VDC: 1 mA

- Opto-Isolation: 3750V (60Hz, 1min)

### Dimensions and Shipping

- Weight: 2 lbs
- Basic Unit: H4.85 x W4.82 x L4.25
- Shark100 - mounts in 92mm DIN and ANSI C39.1 Round Cut-outs
- Shark100T-DIN rail mounted transducer
- Shipping Container Dimensions: 6" cube

### Meter Accuracy

- See page 3

### Compliance:

- IEC 687 (0.2% Accuracy)
- ANSI C12.20 (0.2% Accuracy)
- ANSI (IEEE) C37.90.1 Surge Withstand
- ANSI C62.41 (Burst)
- IEC1000-4-2 – ESD
- IEC1000-4-3 – Radiated Immunity
- IEC 1000-4-4 – Fast Transient
- IEC 1000-4-5 – Surge Immunity

## Ordering Information

To order, please fill out ordering guide:

Model	Frequency	Current Class	V-Switch Pack	Power Supply	COM (Shark100 Only)	Mounting (Shark100 Only)
Option Numbers:	-	-	-	-	-	-
Example:	-60	-10	-V2	-D2	-X	-X
<b>Shark100</b> (Meter/Transducer)	-50 50 Hz System	-10 5 Amp Secondary	-V1 Default V-Switch Volts / Amps	-D2 90-265V AC/DC	-X No Com	-X ANSI Mounting
<b>Shark100T</b> (Transducer Only)	-60 60 Hz System	-2 1 Amp Secondary	-V2 Above with Power and Freq -V3 Above with Energy Counters -V4 Above with Harmonics and Limits	-D 24-48V DC	-485P RS485+Pulse (Standard in Shark 100T)	-DIN DIN Mounting Brackets

## Additional Accessories

### Communication Converters

9PINC – RS232 Cable  
CAB6490 - USB to IrDA Adapter  
Unicom 2500 - RS485 to RS232 Converter  
Unicom 2500-F – RS485 to RS232 to Fiber Optic Converter  
Modem Manager, Model #, MM1 – RS485 to RS232 Converter for Modem Communication  
IrDA232 - IrDA to RS232 Adapter for Remote Read

### Compliance Documents

Certificate of Calibration, Part #: CCal – This provides  
Certificate of Calibration with NIST traceable Test Data.

### Current Transformer Kits

CT200K – 200/5 Ratio .94" Window 3 CTs  
CT400K – 400/5 Ratio, 1.25" Window, 3 CTs  
CT800K – 800/5 Ratio, 2.06" Window, 3 CTs  
CT2000K – 2000/5 Ratio, 3.00" Window, 3 CTs

### CT Specifications:

Frequency: 50 to 400Hz; Insulation: 600 Volts, 10kV BIL  
Flexible Leads: UL 1015 105°C, CSA Approved, 24" Long, #16AWG

### Software Option Numbers

COMEXT3 – CommunicatorEXT 3.0 for Windows®

\* Consult factory application engineer for additional transformer ratios, types or window sizes.



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